

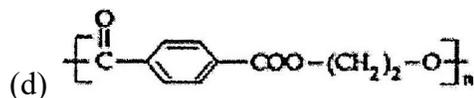
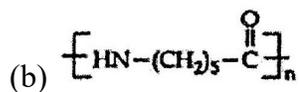
Section - B
CHEMISTRY

- Among the following correct statement is :
 - Brownian movement is more pronounced for smaller particles than for bigger-particles.**
 - Sols of metal sulphides are lyophilic
 - Hardy Schulze law states that bigger the size of the ions, the greater is its coagulating power.**
 - One would expect charcoal to absorb chlorine more than hydrogen sulphide.**
- Excess of **NaOH (aq)** was added to **100 mL** of **FeCl₃(aq)** resulting into **2.14 g** of **Fe(OH)₃**. The molarity of **FeCl₃(aq)** is :
(Given molar mass of **Fe = 56 g mol⁻¹** and molar mass of **Cl = 35.5 g mol⁻¹**)
 - 0.2 M**
 - 0.3 M**
 - 0.6 M**
 - 1.8 M**
- For a reaction, $A_{(g)} \rightleftharpoons A_{(l)}$; $\Delta H = -3RT$. The correct statement for the reaction is :
 - $\Delta H = \Delta U \neq 0$
 - $\Delta H = \Delta U = 0$
 - $|\Delta H| < |\Delta U|$
 - $|\Delta H| > |\Delta U|$
- What is the standard reduction potential (E°) for $Fe^{3+} \rightarrow Fe$? Given that :
 $Fe^{2+} + 2e^- \rightarrow Fe$; $E^\circ_{Fe^{2+}/Fe} = -0.47V$
 $Fe^{3+} + e^- \rightarrow Fe^{2+}$; $E^\circ_{Fe^{3+}/Fe^{2+}} = +0.77V$
 - 0.057 V**
 - +0.057 V**
 - +0.30 V**
 - 0.30 V**
- If the shortest wavelength in Lyman series of hydrogen atom is **A**, then the longest wavelength in Paschen series of **He⁺** is :
 - $\frac{5A}{9}$
 - $\frac{9A}{5}$
 - $\frac{36A}{5}$
 - $\frac{36A}{7}$
- The rate of a reaction **A** doubles on increasing the temperature from **300** to **K**. By how much, the temperature of reaction **B** should be increased from **300 K** so that rate doubles if activation energy of the reaction **B** is twice to that of reaction **A** :
 - 9.84 K**
 - 4.92 K**
 - 2.45 K**
 - 19.67 K**
- An ideal gas undergoes isothermal expansion at constant pressure. During the process :
 - enthalpy increases but entropy decreases**
 - enthalpy remains constant but entropy increases**
 - enthalpy decreases but entropy increases**
 - Both enthalpy and entropy remains constant**
- 50 mL** of **0.2 M** ammonia solution is treated with **25 mL** of **0.2 M HCl**. If pK_b of ammonia solution is **4.75**, the **pH** of the mixture will be :
 - 3.75**
 - 4.75**
 - 8.25**
 - 9.25**
- What quantity (in **mL**) of a **45%** acid solution of a mono-protic strong acid must be mixed with **20%** solution of the same acid to produce **800 mL** of a **29.875%** acid solution ?

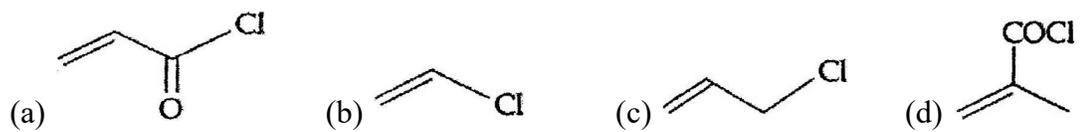
17. The following reaction occurs in the Blast Furnace where iron ore is reduced to iron metal : $\text{Fe}_2\text{O}_3(\text{s}) + 3\text{CO}(\text{g}) \rightleftharpoons 2\text{Fe}(\text{l}) + 3\text{CO}_2(\text{g})$

Using the Le Chatelier's principle, predict which one of the following will not disturb the equilibrium

- (a) **Removal of CO** (b) **Removal of CO₂**
 (c) **Addition of CO₂** (d) **Addition of Fe₂O₃**
18. **XeF₆** on partial hydrolysis with water produces a compound 'X'. The same compound 'X' is formed when **XeF₆** reacts with silica. The compound 'X' is :
 (a) **XeF₂** (b) **XeF₄**
 (c) **XeOF₄** (d) **XeO₃**
19. The number of **P – OH** bonds and the oxidation state of phosphorus atom in pyrophosphoric acid (**H₄P₂O₇**) respectively are :
 (a) **four and four** (b) **five and four**
 (c) **five and five** (d) **four and five**
20. Which of the following statement is correct :
 (a) **Cr⁺² is reducing agent while Mn⁺³ is oxidizing agent, even though both have d⁴ configuration.**
 (b) **The stability of Cu_{(aq)⁺² rather than Cu_{(aq)⁺ is due to much more negative $\Delta_{\text{Hyd}}\text{H}^0$ of Cu_{(aq)⁺² than Cu_{(aq)⁺}}}}**
 (c) **Potassium dycromate is used has a primary standard in volumetric analysis**
 (d) **All statements are correct**
21. Which of the following is a set of green house gases ?
 (a) **CH₄, O₃, N₂, SO₂** (b) **O₃, N₂, CO₂, NO₂**
 (c) **O₃, NO₂, SO₂, Cl₂** (d) **CO₂, CH₄, N₂O, O₃**
22. Which of the following statements is not true about partition chromatography ?
 (a) **Mobile phase can be a gas**
 (b) **Stationary phase is a finely divided solid adsorbent**
 (c) **Separation depends upon equilibration of solute between a mobile and a stationary phase**
 (d) **Paper chromatography is an example of partition chromatography**
23. Which of the following is a biodegradable polymer ?



29. Which of the following compounds will not undergo Friedel Craft's reaction with benzene ?



30. The major product expected from the following reaction is :

